Amendments to the Claims

Please amend claims 1, 8, 12, 25 and 28. The currently pending claims after amendment are listed below.

1   1.   (Currently Amended)   A method of tracing the activity of an expression, said method

2   comprising the <u>machine-implemented</u> steps of:

3   (a) ~~specifying~~ <u>receiving, from a user, a specification of</u> a machine-implemented process

4   in which a trigger expression is to be traced;

5   (b) ~~specifying~~ <u>receiving, from a user, a specification of</u> the trigger expression to be traced

6   in the machine-implemented process<u>, said trigger expression representing a non-</u>

7   <u>executable data value having a state</u>;

8   (c) <u>responsive to steps (a) and (b),</u> monitoring execution of said machine-implemented

9   process to detect occurrences of a plurality of references to a location in machine

10   memory representing a state of said trigger expression<u>, wherein each said occurrence</u>

11   <u>of a reference to a location in machine memory representing a state of said trigger</u>

12   <u>expression occurs</u> ~~occurring~~ as a result of executing said machine-implemented

13   process;

14   (d) responsive to each detected occurrence of a reference to said location in machine

15   memory representing a state of said trigger expression, storing the respective state of

16   the trigger expression at the time of the respective detected occurrence of a reference

17   to said location in machine memory representing a state of said trigger expression to

18   create a history of said trigger expression within the machine-implemented process,

19   said storing step being performed without interrupting the machine-implemented

20   process; and

21   (e) restoring the state of the trigger expression when requested.

1   2.   (Original) The method of claim 1, further comprising:

2   (a)   imposing a condition onto the trigger expression; and

3   (b)   storing the state of the trigger expression only when the condition is satisfied.

3.   (Cancelled)

1   4.   (Previously Presented) The method of claim 1, further comprising:

2   (a)   displaying the history such that the state of the trigger expression each time the trigger

3   expression was active can be displayed separately.

1   5.   (Original) The method of claim 1, wherein the trigger expression is one which results in

2   an L value during the machine-implemented process.

6.   (Cancelled)

1   7.   (Previously Presented) The method of claim 1, wherein the reference to said location in

2   machine memory representing a state of said trigger expression is a Read and/or a Write.

1   8.   (Currently Amended) The method of claim 1, further comprising:

2   (a)   ~~specifying~~ receiving, from a user, a specification of at least one attached expression;

3   (b)   responsive to each detected occurrence of a reference to said location in machine

4   memory representing a state of said trigger expression, storing the respective state of

5   the at least one attached expression at the time of the respective detected occurrence

6   of a reference to said location in machine memory representing a state of said trigger

7   expression, the states of the at least one attached expression being associated with

8   said history of said trigger expression within the machine-implemented process; and

9   (c)   restoring the state of the at least one attached expression when requested.

Docket No.:   CA920010004US1
Serial No.:   10/008,864

1   9.   (Original)   The method of claim 1, wherein the machine-implemented process is a

2   computer program.

1   10.   (Original)   The method of claim 1, as included in an object level trace program.

1   11.   (Original)   The method of claim 1, as included in a debug program.

1   12.   (Currently Amended)   A method of tracing the activity of an expression in an executing

2   computer program, said method comprising the machine-implemented steps of:

3   (a)   ~~specifying~~ receiving, from a user, a specification of the computer program in which a

4   trigger expression resulting in an L value during the execution of the computer

5   program is to be traced;

6   (b)   ~~specifying~~ receiving, from a user a specification of the trigger expression and any

7   optional attachment expressions to be traced in the computer program, said trigger

8   expression representing a non-executable data value having a state;

9   (c)   imposing a condition onto the trigger expression;

10   (d)   responsive to steps (a) and (b), monitoring execution of said computer program to

11   detect occurrences of a plurality of accesses to a location in memory containing a

12   state representing said trigger expression, wherein each said occurrence of an access

13   to a location in memory containing a state representing said trigger expression occurs

14   ~~occurring~~ as a result of executing said computer program;

15   (e)   responsive to each detected occurrence of an access to said location in memory

16   containing a value representing said trigger expression, if said condition is satisfied,

17   then storing the respective state of the trigger expression and any optional attachment

18   expressions at the time of the respective detected occurrence of an access to said

19   location in memory containing a state representing the trigger expression to create a

20   snapshot corresponding to the respective detected occurrence of an access to said

21   location in memory, the step of storing being accomplished without interrupting the

22   process;

23   (f)   creating a profile of the trigger expression comprising storing each snapshot;

24   (g)   displaying the profile such that each snapshot can be displayed separately; and

25   (h)   restoring the state of each snapshot, when requested.

     13-24.   (Cancelled)

     Docket No.:   CA920010004US1
     Serial No.:   10/008,864

1   25.   (Currently Amended)   An article of manufacture, comprising a data storage medium

2   tangibly embodying a program of machine readable instructions executable by an electronic

3   processing apparatus to perform method steps for operating an electronic processing apparatus,

4   said method steps comprising the steps of:

5   (a)   initiating a user interface to exchange data input/output with a user and an electronic

6   processing apparatus;

7   (b)   requesting and receiving a trigger expression from a user, said trigger expression

8   representing a non-executable data value having a state;

9   (c)   requesting and receiving a program identification of a program in which the trigger

10   expression is to be traced;

11   (d)   causing the electronic processing apparatus to execute the identified program;

12   (e)   monitoring execution of the identified program to detect occurrences of a plurality of

13   references to a location in memory representing a state of said trigger expression,

14   wherein each said occurrence of a reference to a location in memory representing a

15   state of said trigger expression occurs occurring as a result of executing the identified

16   program;

17   (f)   responsive to each detected occurrence of a reference to said location in memory

18   representing a state of said trigger expression, storing the respective state of the

19   trigger expression at the time of the respective detected occurrence of a reference to

20   said location in memory representing a state of the trigger expression to create a

21   corresponding respective snapshot, said snapshots forming a history of said trigger

22   expression during execution of the identified program, said storing step being

23   performed without interrupting or otherwise stopping execution of the identified

24   program;

25   (g)   maintaining the capability to restore each snapshot and display each snapshot to the

26   user.

Docket No.:   CA920010004US1
Serial No.:   10/008,864

1   26.   (Original)   The article of manufacture of claim 25, further comprising:

2   (a)   requesting the user to assign conditions to the trigger expression whereupon when the

3   conditions are satisfied, a snapshot of the trigger expression is stored.

1   27.   (Original)   The article of manufacture of claim 25, further comprising:

2   (a)   requesting the user to indicate attached expression whose states are also stored in a

3   corresponding snapshot whenever a snapshot is stored for the trigger expression.

1   28.   (Currently Amended)   A digital data processing device, comprising:

2   (a)   at least one processor;

3   (b)   a memory functionally connected to said at least one processor;

4   (c)   a first computer program executable by said at least one processor;

5   (d)   at least one input device receiving input from a user and at least one output device for

6   presenting output to a user;

7   (e)   a second computer program for tracing said first computer program, said second

8   computer program: (i) receiving a specification of a trigger expression used by said

9   first computer program from said user using said at least one input device, said trigger

10   expression representing a non-executable data value having a state; (ii) responsive to

11   receiving a specification of a trigger expression, monitoring execution of said first

12   computer program to detect occurrences of a plurality of references to a location in

13   said memory representing a value of said trigger expression, wherein each said

14   occurrence of a reference to a location in said memory representing a value of said

15   trigger expression occurs ~~occurring~~ as a result of executing said first computer

16   program; (iii) responsive to each detected occurrence of a reference to said location in

17   said memory representing a value of said trigger expression, storing a corresponding

18   snapshot containing state data of said first computer program, said state data

19   including said trigger expression, said storing step being performed without

20   interrupting said first computer program; (iv) creating a history of said trigger

21   expression during execution of said first program from said snapshots; and (v)

22   presenting said history to said user using said at least one output device.

1   29.   (Previously Presented)   The digital data processing device of claim 28, wherein said

2   second computer program further receives a specification of at least one condition for capturing

3   said snapshot, and performs said step of storing a corresponding snapshot containing state data of

4   said first computer program only if said at least one condition is satisfied.

Docket No.:   CA920010004US1
Serial No.:   10/008,864

1   30.   (Previously Presented)   The digital data processing device of claim 28, wherein said
2   second computer program further received a specification of at least one attachment expression,
3   and responsive thereto, includes said at least one attachment expression in said state data.

1   31.   (Previously Presented)   The digital data processing device of claim 28, wherein the first
2   computer program and the second computer program execute on the same computer.

1   32.   (Previously Presented)   The digital data processing device of claim 28, wherein the first
2   computer program and the second computer program execute on separate units connected by a
3   data communications link.